Dispensing device for drinks

DESCRIPTION

The invention relates to a dispensing device for drinks or similar dosable liquid foodstuffs, in particular for coffee and/or milk or similar hot drinks.

Dispensing devices of this kind are known in many forms. They are used not only in self-service restaurants and canteens, but also in normal hotels and the like, with the result that fewer service personnel are needed behind the counter.

So that on one hand several different drinks, or also mixed drinks, can be dispensed while on the other hand it is not necessary to employ a large number of "specialized" dispensing devices, dispensing devices are designed so that they can be switched into different modes. However, this involves many problems, which in particular are solved by the various valve mechanisms that are needed. For one thing, it turns out that long pipelines are needed, which especially where hot drinks are dispensed is disadvantageous when the dispensing device is not used continuously but rather at intervals, so that cooling effects become noticeable. For another, considerable hygiene-related problems arise, requiring laborious cleaning work that must performed by hand, which is seriously inconvenient where the operation is organized in shifts.

Hence it is the objective of the invention to disclose a dispensing device that enables correct operation of the dispensing device by simple means, with relatively little labor.

This objective is achieved by a dispensing device for drinks or similar dosable liquid foodstuffs, in particular for coffee and/or milk or similar hot drinks, that comprises a supply means to supply at least two different hot drinks, filling outlets to fill at least one container with the hot drinks, and valve means for blocking and opening drink pipelines between the supply means and the filling outlets, wherein the valve means are so constructed that accessory pipelines can be connected thereto instead of the drink pipelines, in order to supply and/or carry away flushing agents for cleaning, hot water or steam for prewarming, or other accessory fluids, for treating the valve means in the regions through which the hot drinks flow.

It is an essential point of the invention that the conduits through which the hot drinks flow, and which are emptied after a dispensing procedure, can be rinsed automatically, i.e. without manually positioning containers to collect the rinse water or connecting tubes to carry that water. As a result, not only is an optimum achieved from a hygienic viewpoint, but also the channels in which the hot drinks run can be warmed before a drink is dispensed. In this way two things can be ensured: optimal servicing of the dispensing device, of value in particular to the manager, and optimal quality of the drinks for the customer.

In an especially preferred embodiment of the invention the valve means comprise at least one sliding element that can be moved by a motor and incorporates at least two channels, each of which is associated with at least one particular mode of operation for dispensing the hot drink when in a first position, and when in a second position is connected to the accessory pipeline. By means of such a sliding element, which preferably is constructed as rotary disks, the number and size of "dead spots" (sites inaccessible by rinsing) can be reduced. Moreover, a particularly high degree of variability of the supply and drainage pipelines becomes possible, so that a large

number of supply means can be connected to a large number of filling outlets, in various combinations.

The filling outlets are preferably disposed directly adjacent to the sliding element, so as to ensure extremely short pathways between the valves formed by the sliding element and the filling outlets. This, in turn, optimizes the hygienic and qualitative properties of the dispensing device.

Preferably two or more sliding elements are provided, containing channels such that two or more hot drinks can be sent to the same filling outlet, either simultaneously or sequentially, as desired. This increases the versatility of the dispensing device.

The filling outlets are preferably provided with at least two flow channels, separated in such a way that the hot drinks flowing through the separate channels are not mixed until they have left the filling outlets, i.e. mixing first occurs substantially within the container. As a result it is possible to ensure an optimal consistency of the drinks, e.g. in the case of cappuccino or latte macchiato.

The channels are preferably connected to one another in such a way that the accessory fluid can be sent through several channels at the same time. Thus in a single rinsing (or prewarming) process several channels can be rinsed simultaneously, which results in a minimization of costs and also an acceleration of the work involved.

Preferably a single accessory pipeline is provided to drain the accessory fluid away, such that the accessory fluid can be sent through the drink pipelines and the drink pipelines can be blocked off directly ahead (in the direction of flow) of the inflow openings for the accessory fluid). Hence the accessory fluid can be admitted to the system either directly at the slider or – as indicated here – upstream of these valve means,

substantially immediately after the point in the supply means at which their first dispensing valve is located. This enables optimal cleaning of the complete set of pipelines used for foodstuffs.

Preferably control means are provided and so designed that after a (each) drinks-dispensing procedure a rinsing procedure is carried out. As a result, hygiene is maximized.

Preferred embodiments of the invention will be evident in the subordinate claims and the following description of an exemplary embodiment with reference to drawings, wherein

- Figure 1 is a side view of part of a dispensing device, partly in section,
- Figure 2 is a view along the line II-II in Figure 1,
- Figure 3 is a view along the line III-III in Figure 1,
- Figure 4 is a perspective drawing of the arrangement according to Figures 1 to 3,
- Figure 5 is a front view in which is indicated the arrangement of the channels for "coffee dispensing double",
- Figure 6 is a view corresponding to Figure 5 for "coffee dispensing single",
- Figure 7 is a view corresponding to Figure 5 for "rinsing coffee side",
- Figure 8 is a view corresponding to Figure 5 for "milk dispensing double",

- Figure 9 is a view corresponding to Figure 5 for "milk dispensing single",

- Figure 10 is a view corresponding to Figure 5 for "rinsing milk side",

- Figure 11 is a view corresponding to Figure 5 for "coffee dispensing double (one cup)",

- Figure 12 is a view corresponding to Figure 5 for "coffee dispensing single (one cup)",

- Figure 13 is a view corresponding to Figure 5 for "rinsing coffee side",

- Figure 14 is a view corresponding to Figure 5 for "milk dispensing double",

- Figure 15 is a view corresponding to Figure 5 for "milk dispensing single",

- Figure 16 is a view corresponding to Figure 5 for "rinsing milk side",

- Figure 17 is a perspective view indicating channels for "dispensing coffee double",

- Figure 18 is a view corresponding to Figure 5 for "dispensing coffee double",

- Figure 19 is a sectional view of the arrangement according to Figure 18 along the line XIX-XIX in Figure 18,

- Figure 20 is a schematic side view similar to Figure 19, in which the channels are represented,

- Figure 21 is a perspective drawing according to Figure 17 for "dispensing milk double",

- Figure 22 is a drawing corresponding to Figure 18 for the function according to Figure 21,

- Figure 23 is a sectional drawing along the line XXIII-XXIII in Figure 22,

- Figure 24 is a drawing corresponding to Figure 20 for the arrangement according to Figure 21,

- Figure 25 is a drawing according to Figure 17 for "dispensing coffee single",

- Figure 26 is a drawing corresponding to Figure 18 for the arrangement according to Figure 25,

- Figure 27 is a sectional drawing along the line XXVII-XXVII in Figure 26,

- Figure 28 is a drawing corresponding to Figure 20 for the arrangement according to Figure 25,

- Figure 29 is a drawing corresponding to Figure 17 for "dispensing milk single",

- Figure 30 is a drawing corresponding to Figure 18 for the arrangement according to Figure 29,

- Figure 31 is a section along the line XXXI-XXXI in Figure 30,

- Figure 32 is a drawing corresponding to Figure 20 for the arrangement according to Figure 29,

- Figure 33 is a drawing correspondding to Figure 17 for "rinsing coffee side",

- Figure 34 is a drawing corresponding to Figure 18 for the arrangement according to Figure 33,

- Figure 35 is a section along the line XXXV-XXXV in Figure 34,

- Figure 36 is a drawing corresponding to Figure 20 for the arrangement according to Figure 33,

- Figure 37 is a drawing correspondding to Figure 17 for the function "rinsing milk side",

- Figure 38 is a drawing corresponding to Figure 18 for the arrangement according to Figure 37,

- Figure 39 is a section along the line XXXIX-XXXIX in Figure 38,

- Figure 40 is a drawing corresponding to Figure 20 for the arrangement according to Figure 37,

- Figure 41 is a drawing correspondding to Figure 18 for the function "simultaneous dispensing of milk and coffee", and

- Figure 42 is a drawing corresponding to Figure 20 for the arrangement according to Figure 41.

In the following description, the same reference numerals are used for identical parts or parts with identical actions.

It should be noted that although the example of a coffee machine shown here is designed to dispense coffee/espresso and milk, it will be clearly evident to a person skilled in the art

that the construction shown in principle here can be modified in many ways, in particular for dispensing a greater variety of "drinks" or also other liquid foodstuffs. Therefore when in the following reference is always made to "coffee" and "milk", this does not restrict the invention to these kinds of drinks. "Coffee" is here intended also to denote in particular espresso, which together with milk and, where appropriate, a foaming means, can be further processed as espresso or latte macchiato.

Figure 1 shows a major element of a dispensing device in a (partially sectioned) side view; the same device is shown again in Figures 2 and 3, in front view together with control elements and in plan view, respectively.

According to Figures 1 to 3, the dispensing device comprises a stationary stand 27 to which is attached, by way of a valve holder 26, a valve means 30 that comprises an outflow block 31 fixed to the valve holder 26; disposed on a first and a second side of the outflow block are a first rotary disk 40 and a second rotary disk 50, respectively. To the outflow block 31 are attached filling outlets 20, 20', below which containers 1, 2 can be placed. Each of the filling outlets 20, 20' comprises a first flow channel 21 and a second flow channel 22, which are each connected to a channel in the outflow block 31 and which join one another at the very end of the filling outlet 20, 20', i.e. just above the container 1, 2.

The two disks 40, 50 are mounted on the shaft 25 and can be rotated together by a motor 24.

The entire arrangement that is fixed to the valve holder 26 can be moved up and down by a vertical drive mechanism 28, to ensure that the filling outlets 20, 20' can be adjusted so that no splashes are caused during the dispensing process, and optimal mixing/filling is produced.

On the outflow block 31 are a first inlet 36 and a second inlet 37, which are connected to a first supply means 5 (in this case for espresso or coffee) and a second supply means 6 (in this case for milk), by way of drink pipelines 9 and valves 7, 8. Into the drink pipelines 9 open a first accessory pipeline 11 and a second accessory pipeline 12, by way of a first accessory valve 13 and a second accessory valve 14; these pipelines carry an accessory fluid from an accessory-fluid supply 10, which provides water, steam, a flushing agent or a mixture thereof. The valves 7, 8, 13, 14 and the motor 24 to adjust the valve means 30 are controlled by a controller 3, which can be operated by way of a keyboard 4. The controller 3 contains control programs for setting the valves or the valve means 30, with its rotary disks 40 and 50; these programs are stored in programmable memory areas or else in permanently preprogrammed memory, in which case the programming is done by the manufacturer of the dispensing device. The programs are such that when a request for a particular drink is input by way of the keyboard 4, the valves or valve means are set appropriately for that drink, and the desired drinks flow through the pipelines for a particular period of time, in order to dispense a predetermined amount.

Also connected to the outflow block 31 is a drainage pipeline 15 connected to a waste-water channel, so that accessory fluid (e.g., a flushing agent) flowing through the pipelines and channels illustrated and described here can be removed, without passing through the filling outlets 20, 20'. The basic construction just described is shown again, in perspective, in Figure 4.

In the following, the function of the valve means 30 during dispensing and cleaning cycles is summarily described for the types of drinks described here, namely coffee and milk, with reference to Figures 5 to 16; a more detailed description is given subsequently. In Figures 5 to 7 and 11 to 13 are shown the channels that are disposed in the first rotary disk 40 and

can be connected to the first inlet 36, whereas Figures 8 to 10 and 14 to 16 show the channels disposed in the second rotary disk 50 and connectable to the second inlet 37, in each case indicated by dashed lines. Channels provided in the outflow block 31 appear in all Figures 5 to 16 (solid lines).

Figures 5 and 11 represent the process of dispensing a "coffee double", in which coffee flows into the first inlet 36 and through the two filling outlets 20, 20', into a container 1, 2.

Figures 6 and 12 illustrate the case in which coffee flows into the first inlet 36 and enters the container 1 through only one filling outlet 20.

In Figures 7 and 13 is shown the case in which, instead of coffee, hot water and/or a flushing agent enters the first inlet 36 (with valve 7 closed and valve 13 opened) and then, after flowing through the channels shown as dispensing coffee in Figures 11 and 12, is carried away in the drainage pipeline 15.

Similarly, Figures 8, 9 and 10, as well as 14, 15 and 16, illustrate the dispensing of milk, which enters through the second inlet 37 and passes through a filling outlet 20 or two filling outlets 20, 20', as well as the rinsing of channels that had previously contained milk by a flushing agent, which (with valve 8 closed and valve 14 opened) flows through the second inlet 37 and is carried away in the drainage pipeline 15.

In the following, with reference to Figures 17 to 20, the function "coffee double" mentioned with reference to Figure 11 is explained in greater detail. At this juncture it should be pointed out that Figures 17 to 40 always show only the outflow block 31 and one of the rotary disks 40 or 50, depending on which of them is necessary for the function being described.

As shown in Figures 17 to 20, the first disk 40 is closely apposed to one vertical surface of the outflow block 31 and is seated on the shaft 25, so that it can be rotated by the motor 24. On the block surface that faces the first disk 40 are situated channels 32 (first channel) and 33 (second channel), each of which opens into the first disk 40. In the surface of the first disk 40 that faces the outflow block 31 a first channel 41 and a second channel 42 are inserted. The first inlet 36 attached to the outflow block 31 is opened by way of bores to the vertical surface of the outflow block 31 that faces toward the first disk 40.

The filling outlets 20, 20' attached to the outflow block 31, i.e. their first flow channels 21, are likewise in communication, by way of bores, with the surface of the outflow block 31 that faces toward the first disk 40.

The drainage pipeline 15, which is also disposed in the outflow block 31, communicates by way of bores (which are especially clearly illustrated in Figure 19) with both vertical surfaces of the outflow block 31.

In the functional setting "coffee double" shown in Figures 17 to 20, coffee flows through the first inlet 36 and the bores provided in the outflow block 31 to the surface of the outflow block 31 and from there, when the first disk 40 is in the rotational position shown in the figures, enters the first channel 41 as well as, in parallel thereto, the second channel 42 in the first disk 40. From these channels the coffee flows into the first channels 21 of the filling outlets 20, 20' and on into the cups 1, 2 positioned below them. Hence this function corresponds to that shown in Figure 11.

In Figures 21 to 24 is shown the analogous function "milk double", in which milk is put into the two cups 1, 2. For this purpose the second rotary disk 50, which is positioned opposite to the first disk 40 on the other vertical surface of the

outflow block 31, comprises a first channel 51 and a second channel 52, which are open toward the surface of the outflow block 31. Corresponding channels that are open toward the second disk 50 are provided in the outflow block 31, namely channels 34 (third channel) and 35 (fourth channel); the third channel 34 communicates at its end with the second inlet 37.

The second flow channels 22 of the filling outlets 20, 20', which are disposed in the outflow block 31, are open by way of bores to the surface of the outflow block 31 to which the second disk 50 is apposed.

In the functional setting "milk double" the milk passes through the second inlet 37, the channels 51 and 52 (parallel) and the second flow channels 22 into the cups 1, 2. This functional setting thus corresponds to that shown in Figure 14.

In the functional setting "coffee single" shown in Figures 25 to 28, which corresponds to Figure 12, the coffee passes from the first inlet 36 through a section of the second channel 42 in the first disk 40 until it reaches the first flow channel 21 of the filling outlet 20, through which it flows into the cup 1 positioned under the outlet.

Figures 29 to 32 show the analogous functional setting corresponding to Figure 15, i.e. the functional setting "milk single", in which milk flows through the second inlet 37, a section of the second channel 52 in the second disk 50 and the second flow channel 22 of the filling outlet 20, before entering the cup 1.

In the following, the functional setting "rinsing coffee" (corresponding to Figure 13) is explained with reference to Figures 33 to 36.

In this functional setting the valve 7 is closed and the valve 13 is opened, so that the accessory-fluid supply 10 is in

communication with the first inlet 36 in the outflow block 31 by way of the first supplementary pipeline 11 and the drink pipeline 9. From the first inlet 36, the cleaning fluid flows through the first channel 32 in the outflow block 31 into one end of the first channel 41 in the first rotary disk 40 and on through that channel; emerging from its other end, it enters the second channel 33 in the outflow block 31 and passes from there into the first end of the second channel 42 in the first disk 40 and out of its second end into the drainage pipeline 15, through the associated bores in the outflow block 31. In this way all of the channels that come into contact with coffee while that drink is being dispensed are rinsed with cleaning fluid.

For this purpose the controller 3 is designed so that after every drink has been dispensed (e.g. Figure 11 or Figure 12) cleaning (Figure 13; Figures 33 to 36) of the relevant channels occurs before a new dispensing process is initiated.

In the function illustrated in Figures 16 and 37 to 40, namely "rinsing milk", the channels through which milk has previously flowed (Figures 14 or 15) are rinsed in an analogous manner. With valve 8 closed and valve 14 opened, therefore, the cleaning fluid flows into the second inlet 37 and from there into one end of the channel 34 in the outflow block 31, out of its other end into one end of the first channel 51 in the second rotary disk 50, out of its second end through the fourth channel 35 in the outflow block and into the first end of the second channel 52 in the second disk 50, and finally through its second end into the bores of the drainage pipeline 15, to be discarded. Here, again, the cleaning fluid passes through all of the channels through which milk had previously flowed (see Figures 14 and 21 to 24 as well as Figures 15 and 29 to 32).

Finally, Figures 41 and 42 show how the rotary disks 40 and 50 are positioned, i.e. the channels are arranged, in order to

fill containers 1, 2 with coffee and milk simultaneously. The positions here correspond to a combination of the positions shown in Figures 11 and 14 as well as 17 to 20 and 21 to 24, with the difference that the first inlet 36 is supplied with coffee and at the same time the second inlet 37 is supplied with milk, by opening the valves 7 and 8 (while valves 13 and 14 are closed). The associated rinsing process corresponds to a combination of the previously illustrated rinsing processes according to Figures 13 and 16 as well as 33 to 36 and 37 to 40.

It can be seen from the above that in the embodiment presented here the two rotary disks 40 and 50 can be rigidly connected to one another. Of course it is also possible to control the two disks 40 and 50 separately from one another, so that still other valve routes or channels can be provided in the disks.

In addition to the rinsing process after every drink-dispensing procedure (or after a larger group of dispensing procedures), in which all the channels through which drinks had previously flowed are rinsed without dead zones, so to speak, it is also possible to take the arrangement apart completely with relatively few manipulations, in order to gain access to the channels that open to the exterior. However, this is in general not necessary, because the rinsing encompasses all the regions through which foodstuffs flow.

List of reference numerals

1	Container	34	3rd channel
2	Container	35	4th channel
3	Controller	36	1st inlet
4	Keyboard	37	2nd inlet
5	1st supply means	40	1st rotary disk
6	2nd supply means	41	1st channel
7	1st valve	42	2nd channel
8	2nd valve	50	2nd rotary disk
9	Drink pipeline	51	1st channel
10	Supplementary-fluid supply	52	2nd channel
11	1st supplementary pipeline		
12	2nd supplementary pipeline		
13	1st supplementary valve		
14	2nd supplementary valve		
15	Drainage pipeline		
20, 20'	Filling outlet		
21	1st flow channel		
22	2nd flow channel		
24	Motor		
25	Shaft		
26	Valve holder		
27	Stand		
28	Vertical drive		
30	Valve means		
31	Outflow block		
32	1st channel		
33	2nd channel		